

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/786,474

DATE: 07/27/2001

TIME: 19:50:51

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw

ENTERED

4 <110> APPLICANT: NAGAI, KAZUO  
5 WACHI, MASAOKI  
7 <120> TITLE OF INVENTION: NOVEL GENE  
9 <130> FILE REFERENCE: 084335/0131  
11 <140> CURRENT APPLICATION NUMBER: 09/786,474  
12 <141> CURRENT FILING DATE: 2001-03-05  
14 <150> PRIOR APPLICATION NUMBER: PCT/JP98/03981  
15 <151> PRIOR FILING DATE: 1998-09-04  
17 <160> NUMBER OF SEQ ID NOS: 6  
19 <170> SOFTWARE: PatentIn Ver. 2.1  
21 <210> SEQ ID NO: 1  
22 <211> LENGTH: 1920  
23 <212> TYPE: DNA  
24 <213> ORGANISM: Corynebacterium glutamicum  
26 <400> SEQUENCE: 1  
27 atgtgcgggc ttcttgcat attgactgca aatgggaacg ctgaagcatt cgttcctgca 60  
29 ctogagcggg ccttgccatg catgcgccac cgtggctctg acgatgccg cacttgcat 120  
31 gacgcgatg cagegtttg attcaaccgc ctctccatca ttgatattgc aactccac 180  
33 caaccactgc gttggggacc tgcgatgaa ccgaccgct acgcaatgac tttcaacggt 240  
35 gagatctaca actacgttga gctgcgtaaa gagctctcgg atttgggata tacctttaat 300  
37 acttctggcg atggcgagcc aattgttgtc ggtttccacc actggggcga gtcggtggtc 360  
39 gagcatctcc gcggaatgtt cggcattgcc atttgggata caaaggaaaa gtcgcttttc 420  
41 cttgcgcgtg atcagttcgg catcaagcca ctggtctacg caaccaccga gcatggcacc 480  
43 gtgttctcct cagagaagaa gaccatcttg gagatggcg aggatgaa tctagatctg 540  
45 ggccttgata agcgacccat tgagcactac gtggacctgc agtacgtgcc cgagccagat 600  
47 acccttcacg cgcagatttc ccgcttgag tgaggtgca ccgcaacagt tcgtccgggc 660  
49 ggcaagctgg aacagaagcg ttacttcaag cctcagttcc cagtacagaa ggtcgtaaa 720  
51 ggtaaggagc aggacctctt cgatcgcat gcccaggtgt tggaggatag cgtcgaaaag 780  
53 catatgcgtg ccgacgtgac cgtaggtcgt ttcctttccg gcggcattga ctcaaccgca 840  
55 attgcgcgcg ttgcaaagcg ccacaacct gacctgtca ccttcaccac cggtttcgag 900  
57 cgtgaaggct actcggaggt cgatgtggct gcggagtccg ccgctgcgat tggcgctgag 960  
59 cacatcgtga agattgtctc gcctgaggaa tacgccaacg cgattcctaa gatcatgttg 1020  
61 tacttgatg atcctgtagc tgacccatca ttggtcccgc tgtacttcgt ggcagcgga 1080  
63 gcacgtaagc acgtcaaggt tgtgctgtct ggcgaggcg cagatgagct gttcggtgga 1140  
65 tacaccattt acaaagagcc gctatcgctt gctccatttg agaagatccc tccccacta 1200  
67 cgtaaaggcc tgggaaagct cagcaaggtt ctgccagacg gcatgaagg caagtccctt 1260  
69 cttgagcgtg gctccatgac catggaagag cgtactacg gcaacgctcg ctccctcaat 1320  
71 ttcgagcaga tgcaacgctt tattccatgg gcaaagcgcg aatgggacca ccgcaagtc 1380  
73 actgcaccga tctacgcaca atcccgaac tttgatccag tagcccgcat gcaacacctg 1440  
75 gaactgttca cctggatgcg cggcgacatc ctggtcaagg ctgacaagat caacatggcg 1500  
77 aactcccttg agctgcgagt tccattcttg gataaggaa ttttcaaggt tgcagagacc 1560  
79 attccttacg atctgaagat tgccaacggt accaccaagt acgcgctgcg cagggcactc 1620  
81 gagcagattg ttccgcttca cgttttgac cgcaagaagc tgggcttccc tgttcccatg 1680  
83 cgccactggc ttgcggcgca tgagctgttc ggttgggcgc aggacacat taaggaaatcc 1740  
85 ggtactgaag atatcttcaa caagcaggct gtgctggata tgctgaacga gcaccgcgat 1800  
87 ggcgtgtcag atcattcccg tcgactgtgg actgttctgt catttatggt gtggcacggc 1860  
89 atttttgtgg aaaaccgcat tgatccacag attgaggacc gtcctaccc ggtcgagctt 1920

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/786,474

DATE: 07/27/2001

TIME: 19:50:51

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw

```

92 <210> SEQ ID NO: 2
93 <211> LENGTH: 640
94 <212> TYPE: PRT
95 <213> ORGANISM: Corynebacterium glutamicum
97 <400> SEQUENCE: 2
98 Met Cys Gly Leu Leu Gly Ile Leu Thr Ala Asn Gly Asn Ala Glu Ala
99   1           5           10           15
101 Phe Val Pro Ala Leu Glu Arg Ala Leu Pro Cys Met Arg His Arg Gly
102           20           25           30
104 Pro Asp Asp Ala Gly Thr Trp His Asp Ala Asp Ala Ala Phe Gly Phe
105           35           40           45
107 Asn Arg Leu Ser Ile Ile Asp Ile Ala His Ser His Gln Pro Leu Arg
108           50           55           60
110 Trp Gly Pro Ala Asp Glu Pro Asp Arg Tyr Ala Met Thr Phe Asn Gly
111           65           70           75           80
113 Glu Ile Tyr Asn Tyr Val Glu Leu Arg Lys Glu Leu Ser Asp Leu Gly
114           85           90           95
116 Tyr Thr Phe Asn Thr Ser Gly Asp Gly Glu Pro Ile Val Val Gly Phe
117           100          105          110
119 His His Trp Gly Glu Ser Val Val Glu His Leu Arg Gly Met Phe Gly
120           115          120          125
122 Ile Ala Ile Trp Asp Thr Lys Glu Lys Ser Leu Phe Leu Ala Arg Asp
123           130          135          140
125 Gln Phe Gly Ile Lys Pro Leu Phe Tyr Ala Thr Thr Glu His Gly Thr
126           145          150          155          160
128 Val Phe Ser Ser Glu Lys Lys Thr Ile Leu Glu Met Ala Glu Glu Met
129           165          170          175
131 Asn Leu Asp Leu Gly Leu Asp Lys Arg Thr Ile Glu His Tyr Val Asp
132           180          185          190
134 Leu Gln Tyr Val Pro Glu Pro Asp Thr Leu His Ala Gln Ile Ser Arg
135           195          200          205
137 Leu Glu Ser Gly Cys Thr Ala Thr Val Arg Pro Gly Gly Lys Leu Glu
138           210          215          220
140 Gln Lys Arg Tyr Phe Lys Pro Gln Phe Pro Val Gln Lys Val Val Lys
141           225          230          235          240
143 Gly Lys Glu Gln Asp Leu Phe Asp Arg Ile Ala Gln Val Leu Glu Asp
144           245          250          255
146 Ser Val Glu Lys His Met Arg Ala Asp Val Thr Val Gly Ser Phe Leu
147           260          265          270
149 Ser Gly Gly Ile Asp Ser Thr Ala Ile Ala Pro Leu Ala Lys Arg His
150           275          280          285
152 Asn Pro Asp Leu Leu Thr Phe Thr Thr Gly Phe Glu Arg Glu Gly Tyr
153           290          295          300
155 Ser Glu Val Asp Val Ala Ala Glu Ser Ala Ala Ala Ile Gly Ala Glu
156           305          310          315          320
158 His Ile Val Lys Ile Val Ser Pro Glu Glu Tyr Ala Asn Ala Ile Pro
159           325          330          335
161 Lys Ile Met Trp Tyr Leu Asp Asp Pro Val Ala Asp Pro Ser Leu Val
162           340          345          350

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/786,474

DATE: 07/27/2001

TIME: 19:50:51

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw

```

164 Pro Leu Tyr Phe Val Ala Ala Glu Ala Arg Lys His Val Lys Val Val
165           355           360           365
167 Leu Ser Gly Glu Gly Ala Asp Glu Leu Phe Gly Gly Tyr Thr Ile Tyr
168       370           375           380
170 Lys Glu Pro Leu Ser Leu Ala Pro Phe Glu Lys Ile Pro Ser Pro Leu
171 385           390           395           400
173 Arg Lys Gly Leu Gly Lys Leu Ser Lys Val Leu Pro Asp Gly Met Lys
174           405           410           415
176 Gly Lys Ser Leu Leu Glu Arg Gly Ser Met Thr Met Glu Glu Arg Tyr
177           420           425           430
179 Tyr Gly Asn Ala Arg Ser Phe Asn Phe Glu Gln Met Gln Arg Val Ile
180       435           440           445
182 Pro Trp Ala Lys Arg Glu Trp Asp His Arg Glu Val Thr Ala Pro Ile
183       450           455           460
185 Tyr Ala Gln Ser Arg Asn Phe Asp Pro Val Ala Arg Met Gln His Leu
186 465           470           475           480
188 Asp Leu Phe Thr Trp Met Arg Gly Asp Ile Leu Val Lys Ala Asp Lys
189           485           490           495
191 Ile Asn Met Ala Asn Ser Leu Glu Leu Arg Val Pro Phe Leu Asp Lys
192           500           505           510
194 Glu Val Phe Lys Val Ala Glu Thr Ile Pro Tyr Asp Leu Lys Ile Ala
195       515           520           525
197 Asn Gly Thr Thr Lys Tyr Ala Leu Arg Arg Ala Leu Glu Gln Ile Val
198       530           535           540
200 Pro Pro His Val Leu His Arg Lys Lys Leu Gly Phe Pro Val Pro Met
201 545           550           555           560
203 Arg His Trp Leu Ala Gly Asp Glu Leu Phe Gly Trp Ala Gln Asp Thr
204           565           570           575
206 Ile Lys Glu Ser Gly Thr Glu Asp Ile Phe Asn Lys Gln Ala Val Leu
207           580           585           590
209 Asp Met Leu Asn Glu His Arg Asp Gly Val Ser Asp His Ser Arg Arg
210       595           600           605
212 Leu Trp Thr Val Leu Ser Phe Met Val Trp His Gly Ile Phe Val Glu
213       610           615           620
215 Asn Arg Ile Asp Pro Gln Ile Glu Asp Arg Ser Tyr Pro Val Glu Leu
216 625           630           635           640
219 <210> SEQ ID NO: 3
220 <211> LENGTH: 3825
221 <212> TYPE: DNA
222 <213> ORGANISM: Corynebacterium glutamicum
224 <400> SEQUENCE: 3
225 gaattcaccc tcgccacgct ttccagccct ctttgcgccc caggcaaaga tggcggtgag 60
227 gaatagaccc cacatgatga tgccgatgat ccaggcagca acccagaccc atgaccagaa 120
229 gttacccatg gccactgctt caggggtaat gccatcaggc caaccatac gtaggaaatc 180
231 tccaagcaca ccgccagagg ggcgacttca cagcctgcga tggcgaggcc acctaagctc 240
233 aagacaccgc caagcagggc cttgcgcttt aaaccacgct tattttgctg ttctacgtgt 300
235 gttctgcctt cctgtccaca caaaaaccag agaccttacg gtcatttcta tcttcgcaga 360
237 atagcctatt tgccagccga ttccatatct tgtgtttggt ggaaatatct tcgtgggttt 420
239 cgttttttagg ggcgtcaaat gtctttcaac tgcaacgata tgcccgaatc ctcagggtga 480

```

## RAW SEQUENCE LISTING

DATE: 07/27/2001

PATENT APPLICATION: US/09/786,474

TIME: 19:50:51

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw

```

241 atacctaaag tctaggcaat tgggtgatgc cactgcacag accatcaacc ttttgattgc 540
243 ccttgaaatt cccccaccct taccacctac gtccctacaa ggtgcatgta ttaggaaatc 600
245 aatctggttt tcaggaacct ttgaggatgc tgcaatagtc agctgatgca cgttgtttga 660
247 gggagctttc gtcaattttg gcggtgccct ttacactcag atgtaacttc gccgtatcgt 720
249 tgacacgaga tttaacaaat gcagcgtctt atttcttcca aaaaaatttc tttgcgattt 780
251 aaggcgcttt ttattttcagg aggattttttc attcatgtgc ggccttcttg gcatattgac 840
253 tgcaaatggg aacgctgaag cattcggttc tgcactcgag cgggccttgc catgcatgcg 900
255 ccaccgtggt cctgacgatg ccggcacttg gcatgacgcc gatgcagcgt ttggattcaa 960
257 ccgcctctcc atcattgata ttgcacactc ccaccaacca ctgcgttggg gacctgcgga 1020
259 tgaacccgac cgctacgcaa tgactttcaa cggtgagatc tacaactacg ttgagctgcg 1080
261 taaagagctc tcggattttg gatatacctt taatacttct ggcgatggcg agccaattgt 1140
263 tgtcggtttc caccactggg gcgagtcctg ggtcgagcat ctccgcggaa tgttcggcat 1200
265 tgccattttg gatacaaagg aaaagtcgct ttcccttgcg cgtgatcagt tcggcatcaa 1260
267 gccactgttc tacgcaacca ccgagcatgg caccgtgttc tcctcagaga agaagaccat 1320
269 cttggagatg gccgaggaga tgaatctaga tctgggcctt gataagcgca ccattgagca 1380
271 ctacgtggac ctgcagtacg tgcccgagcc agataccctt caccgcgaga tttcccgctt 1440
273 ggagtcaggc tgcaccgcaa cagttcgtcc gggcggcaag ctggaacaga agcgttactt 1500
275 caagcctcag ttcccagtac agaaggtcgt aaagggtaag gagcaggacc tcttcgatcg 1560
277 cattgcccag gtgttgagg atagcgtcga aaagcatatg cgtgcgcgag tgaccgtagg 1620
279 ctcgttcctt tccggcgcca ttgactcaac cgcaattgcg ccgcttgcaa agcgccacaa 1680
281 ccctgacctg ctacacctca ccaccggttt cgagcgtgaa ggctactcgg aggtcgatgt 1740
283 ggctgcggag tccgcgctg cgattggcgc tgagcacatc gtgaagattg tctgcctga 1800
285 ggaatacgcc aacgcgattc ctaagatcat gtggtacttg gatgatcctg tagctgacc 1860
287 atcattggtc ccgctgtact tcgtggcagc ggaagcacgt aagcacgtca aggttgtgct 1920
289 gtctggcgag ggcgcagatg agctgttcgg tggatacacc atttacaag agccgctatc 1980
291 gcttgctcca tttgagaaga tcccttcccc actacgtaaa ggctgggaa agctcagcaa 2040
293 ggttctgcca gacggcatga agggcaagtc ccttcttgag cgtggctcca tgaccatgga 2100
295 agagcgctac tacggcaacg ctgcctcctt caatttcgag cagatgcaac gcgttattcc 2160
297 atgggcaaag cgcgaatggg accaccgcga agtcaactgca ccgatctacg cacaatccc 2220
299 caactttgat ccagtagccc gcatgcaaca cctggatctg ttcacctgga tgcgcggcga 2280
301 catcctggtc aaggctgaca agatcaacat ggcgaactcc cttgagctgc gatttccatt 2340
303 cttggataag gaagttttca aggttgcaag gaccattcct tacgatctga agattgcaa 2400
305 cggtaaccac aagtagcgcc tgcgcagggc actcgagcag attgttcgc ctcacgtttt 2460
307 gcaccgcaag aagctgggct tccctgttcc catgcgccac tggcttgccg gcgatgagct 2520
309 gttcggttgg gcgcaggaca ccattaagga atccggtact gaagatatct tcaacaagca 2580
311 ggctgtgctg gatatgctga acgagcaccc cgatggcggt tcagatcatt ccgctcgact 2640
313 gtggactggt ctgtcattta tgggtgtggc cggcattttt gtggaaaacc gcattgatcc 2700
315 acagattgag gaccgctcct acccggtcga gctttaagtc ttaaagccta aaccctcc 2760
317 ttctcaagga gggggtttca ctatttctcg aggacaaagc aattacgcca gaaacacaa 2820
319 aagctcggcc gtagacaatg cgtccagggc cgagccttta ttcctatata acggaatctc 2880
321 tttagttgaa ggagtcacca caagcgcaag agctgcctgc gtttggttg tcgatggtga 2940
323 agccctgctg ctgatgggtg tcagcgaagt cgatctgagc gccgagcagg tatggggtgc 3000
325 tcactctgtc aacgacaagg cgaacgccac cgacgatgtc ttccttatcg ccatcaagg 3060
327 tgcggctgct gaagtaaagc tggtaacgaa ggccagagca gccgccaggc tgaacggcga 3120
329 tacgcagaga gaggctgctg cggccttccg gatcgatgag tgccttagct ttggacgctg 3180
331 cggactcggt caagataaca ccggtgttg tttgatggagc ggtcatcgct ttagtctcct 3240
333 taactgttgg ccctttgaat tacttttagg ccgggacatc ataggcttgc agtgactcc 3300
335 cctttttacg gatctccggc gagcgatgct ggattacgtt catatgggaa gcggatggat 3360
337 gttccccagc ctactcaccg tccacagatg agtaaaccgg gaaaaaccgg tatttagtta 3420

```

## RAW SEQUENCE LISTING

DATE: 07/27/2001

PATENT APPLICATION: US/09/786,474

TIME: 19:50:51

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw

```

339 ttggttttac ctgcgtgggc tgaaagtctt cacttttaat ccttacagat ggtcgttctg 3480
341 attcctttca acgatgaagt gtgcacccct attcccgaatt tgggaggttt tccttgtagc 3540
343 ctattgagtg tgaaacttcc ttgggataaa aataagaaca acgaaggggc tgacgctgca 3600
345 ggccaagacg ccagctccac ccctgagacc gctacgcctg acgctactga gcagaaattg 3660
347 ccaaaggggc acacggcacc gaagggccgt cccactccga agcgtcgtga agttgagtta 3720
349 gagcgaggtg tcgttggcgg ccagtccttg gcgcctactg atacttatgc gcagcagcgc 3780
351 cagaagcgta aagaatttaa agcatctatg accaaggaag aattc 3825
354 <210> SEQ ID NO: 4
355 <211> LENGTH: 25
356 <212> TYPE: DNA
357 <213> ORGANISM: Artificial Sequence
359 <220> FEATURE:
360 <223> OTHER INFORMATION: Description of Artificial Sequence: Synthetic DNA
362 <400> SEQUENCE: 4
363 tgaacccgac cgcattgcca tgact 25
366 <210> SEQ ID NO: 5
367 <211> LENGTH: 25
368 <212> TYPE: DNA
369 <213> ORGANISM: Artificial Sequence
371 <220> FEATURE:
372 <223> OTHER INFORMATION: Description of Artificial Sequence: Synthetic DNA
374 <400> SEQUENCE: 5
375 tccaaggtcg acatgatctt aggaa 25
378 <210> SEQ ID NO: 6
379 <211> LENGTH: 17
380 <212> TYPE: DNA
381 <213> ORGANISM: Artificial Sequence
383 <220> FEATURE:
384 <223> OTHER INFORMATION: Description of Artificial Sequence: Synthetic DNA
386 <400> SEQUENCE: 6
387 caggaaacag ctatgac 17

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/786,474

DATE: 07/27/2001

TIME: 19:50:52

Input Set : A:\84335131.app

Output Set: N:\CRF3\07272001\I786474.raw